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09/343,092	06/30/1999	HIDEO SAMURA	50059-048	7482
20277	7590	11/25/2005	EXAMINER	
MCDERMOTT WILL & EMERY LLP			NGUYEN, LAM S	
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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/343,092
Filing Date: June 30, 1999
Appellant(s): SAMURA, HIDEO

NOV 25 2005
GROUP 2800

Gene Z. Rubison
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 09/21/2005 appealing from the Office action mailed 01/24/2005.

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(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4680595	CRUZ-URIBE	7-1987
6099111	CHANG	8-2000
5530465	HASEGAWA ET AL.	6-1996

(9) Grounds of Rejection

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The following ground(s) of rejection are applicable to the appealed claims:

1. Claims 1, 4-7, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cruz-Uribe (US 4680595) in view of Chang (US 6099111) and Hasegawa et al. (US 5530465).

Cruz-Uribe et al. discloses a head for ink-jet printer comprising:

a substrate on which a plurality of ink nozzles (*FIG. 3, elements 34, 68*) and a plurality of ink passages (*FIG. 3, element 66*) each communicating separately to each of the ink nozzles;

an inorganic substrate which is joined with said substrate and is provided with ink chambers (*FIG. 3, element 30*) each communicating separately to each of the ink passages (*FIG. 3, element 66*); and

a piezoelectric element (*FIG. 3, element 50*) of ferroelectric substance for changing separately a capacity of each of the ink chambers to jet an ink from said ink nozzles through said ink passages;

wherein said ink passages are fine as compared with said ink chambers and said ink nozzles are fine as compared with said ink passages (*FIG. 3, elements 30 and 66: The width of the ink passage 66 is narrower than the one of the ink chamber 30*); and

wherein said inorganic substrate has a common ink supply port (*FIG. 3-5, element 40, 28, 24, 26*) for supplying ink to said plurality of ink passages (*FIG. 4*) at a portion on a surface of said inorganic substrate.

- Cruz-Uribe et al. does not disclose wherein the common ink supply port is located

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between a plurality of said piezoelectric elements, wherein said ink nozzles have tapered configurations (**Referring to claim 4**), and an ink tank for storing ink supplied to said ink chambers of said printer head (**Referring to claim 7**).

Chang discloses an ink jet recording head having piezoelectric elements (*FIG. 2, element 11, 12*) acting as pressure generating elements on ink chambers (*FIG. 2, element 3, 4*) to eject ink drops through nozzles having tapered configurations (*FIG. 2, elements 7, 8*), wherein the ink chambers are filled with ink through a common ink supply port from an ink tank (*FIG. 2, element 2, 13, 20, 22*) that is located between a plurality of said piezoelectric elements (*FIG. 2, element 11, 12*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the printhead disclosed by Cruz-Urbe et al. such that locating the common ink supply port between a plurality of said piezoelectric elements as disclosed by Chang. The motivation of doing so is to prevent crosstalk as much as possible from occurring thereby allowing the ink droplet ejection characteristics to be stabilized as taught by Cruz-Urbe et al. (*column 2, lines 28-31*).

- Cruz-Urbe et al. also does not disclose wherein the substrate on which the plurality of ink nozzles and the plurality of ink passages are formed by a plasma etching method is a silicon substrate, wherein said silicon substrate has a construction in which plural silicon substrates are laminated, and wherein said ink nozzles and said ink passages are communicated by laminating the silicon substrate in which said ink nozzles are processed and the silicon substrate in which said ink passages are processed. (**Referring to claims 5-6**).

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Hasegawa et al. discloses an ink jet head provided with a plurality of nozzles and ink passages arranged in an array on laminated silicon substrates in which the ink nozzles and the ink passage are communicated (*Abstract and column 2, lines 11-14, FIG. 8B, elements 101, 107*), wherein the plurality of nozzles and ink passages are formed by a plasma etching method (*column 15, lines 21-30 and column 16, lines 14-30*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the printhead disclosed by Cruz-Urbe et al. such that forming the ink nozzles and the ink passages on the silicon substrate as disclosed by Hasegawa et al. The motivation of doing so is to obtain high nozzle density even when number of nozzles is increased as taught by Hasegawa et al. (*column 4, lines 34-35*).

Cruz-Urbe also disclose the following claimed invention:

Referring to claim 11: wherein said ink passages have a cross-sectional area less than a cross-sectional area of said ink chambers, and wherein said ink nozzles have a cross-sectional area less than a cross-sectional area of said ink passages (FIG. 3, elements 34,30, 66).

(10) Response to Argument

First of all, in response to the appellant's argument that Cruz-Urbe does not identify a silicon substrate (page 5, first paragraph), the examiner cites that such Cruz-Urbe's deficiency, however, is cured by Hasegawa's silicon substrate as stated on page 3-4 of the final office action (mailed on 01/24/2005), which the appellant did not argue about.

Secondly, the appellant argued that Chang has no teaching that the position of a common ink supply port relative to piezoelectric elements plays any importance in achieving the asserted benefit. The examiner does not agree with the above argument. From Chang's disclosure

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(column 2, lines 21-30), one can understand that in order to prevent a crosstalk as much as possible, the pressure of the ink, which reversely flows from the pressure generating chambers through the common ink supply port to the ink tank, must be absorbed as much as possible by the tank. In addition, the shorter the ink communication path (from the pressure generating chamber to the tank) is, the more quickly such pressure is absorbed. As a result, Chang locates the common ink supply port between the plurality of the pressure generating chambers (associating to the plurality of piezoelectric elements) in order to shorten the ink communication path from the tank to every pressure generating chambers. Therefore, Chang expressly teaches that the position of the common ink supply port plays an important role in preventing the crosstalk. It thus would have been obvious to one of ordinary skill in the art would modify the Cruz-Urbe device to reduce the ink communication path in order to gain the reserve pressure absorption and reduce the crosstalk.



For the above reasons, it is believed that the rejections should be sustained.

(11) Related Proceeding(s) Appendix


No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

LN
November 21, 2005

Conferees:

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Respectfully submitted


STEPHEN MEIER
SUPERVISORY PATENT EXAMINER

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